

# BEHAVIOURAL CHARACTERISTICS OVER BURN CRUSHED BRICK AS AGGREGATE IN CONCRETE MIX

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**Abstract**— This thesis is mainly concerned with the properties of the concrete using over burn brick aggregate, because of shortage of the natural aggregate in Northern India. Three types of cements are used so that it is judged what type of cement can also be used to become even more decent quality of the concrete used for building purposes. Three grades of concrete were casted and the equivalent strength was found. Cubes and beams were cast for this purpose. It was found that Portland slag cement gave the best outcome out of the all cements used. Pozzolana cement gave second best results and ordinary Portland cement showed the minimum compressive and flexural strengths. Take a look at outcomes shown that mistreatment crushed bricks decreases the strength of concrete. Also, the ratio of water to cement (w/c) magnitude relation will increase for constant slump once the proportion of crushed brick augmented. The outcomes show that crushed over burn brick are appropriate to exchange the granite mix in concrete making. Trial mix of crushed over burn brick concrete were ready by substitution the Granite Aggregate with 25 percent, 50 percent, 75 percent and 100 percent crushed over burn brick by volumes M20 grades of each Granite aggregate. And crushed over burn bricks concretes were ready and test to equal the compressive strength. The take a look at results presented that it's doable to provide crushed over burn brick concrete with characteristic like those of GA concrete with 25 percent replacement.

**Index Terms**— Over burn brick, aggregate, Portland pozzolana cement, ordinary Portland cement, Portland slag cement, Water, compressive strength test, slump test.

## I. INTRODUCTION

Concrete is made by admixture cement, sand, coarse aggregate and water to provide a material that may be moulded into virtually any form. The most important volume of concrete is full of coarse aggregate. Aggregate inclusion in concrete decreases its drying shrinkage and increases several different character. Aggregate is additionally the smallest amount dearly-won per weight unit, however it makes the foremost quantity of the burden. It's pricey to move therefore native sources area unit required, however because of geographical constraint this is often not obtainable the least bit places, so it necessitate finding different source what's more, options from local sources. In eastern and north eastern conditions of India wherever regular shake stores are rare, squashed over burn bricks are utilized as a substitute supply of coarse total. In these

spots of India over burn brick total are generally used as coarse mix. The work and execution of cement mad with cracked over burn bricks as coarse total zone unit very inside and out and acceptable for typical cement. All the higher than mentioned studies were for traditional strength concrete; but, makes an attempt have conjointly been created to provide high strength concrete victimization over burn brick chips as coarse combination. Over burn brick aggregate concrete conjointly performs well or maybe higher than natural aggregate concrete below warmth. Of these studies even the employment of crushed over burn brick as an alternate supply of coarse aggregate in concretes. However, there's hardly any prose on use of over burn brick aggregate in permeable concrete. This absence of documentation along with potential of victimization over burn brick chips as a viable different of coarse combination in permeable concrete impelled the authors to try and do this study. This experimental investigation allotted on concrete made from crushed over burn brick combination of selected strength. The resolves of this paper is research the promising use of over burn bricks as additional for natural coarse mix in concrete and make light weight of concrete. To achieve this objectives the physically and mechanically character of Over Burn Brick mix the kind of waste bricks thought-about during this study is obtained throughout the development of some buildings in larger Noida site and this sort is tested to induce its mechanical properties before used. traditional concrete specimens mistreatment traditional mixture are casted and tested to match their results with Over Burn Brick mixture made of construction waste. Check results obtained square measure conferred and mentioned here during this paper.



Fig. 1 Collection of sample from pug mill

## II. MATERIAL USED

### A. Ordinary Portland Cement

One of the cement used was normal Portland cement of forty three grade conformist to IS: 8112-1989. This Cement is that the most typically used cement altogether constructions as well as plain and strengthened cement, concrete, over burn bricks and masonry wall, bases covering and joint used in the maintenance of all types of building, wing wall, roads, water retentive structures, etc. it according to BIS (IS 8112-1989 for 43 grade OPC) on compressive strength levels (in 14 days of 33 MP). Cement is marketed, in specially designed 50kg+200gm one bag. Relative density of this cement was 3.15.

### B. Portland Pozzolana Cement

It is the final name for the cluster of cement containing over {20} percent, active additives. The "Pozzolana Cement" springs from the name of a friable igneous rock. Pozzolana utilized in ancient Rome as an additives to lime within manufacture of Portland cement. In smart construction the most important variety of pozzolana cement is Portland pozzolana cement, created by crushing along Portland cement residue, a full of life mineral additive {(20-40) percent}, and a little low quantity of mineral. It differs from normal Portland cement, unit's greater resistance to corrosion (especially in sulfate waters), reduced rate of hardening, and lesser ice resistance. Pozzolana cement is used primarily to provide concretes used in underground structures.

### C. Portland slag cement

PSC is generally used in concrete, each side as a single building material part, or as a parts of intermingled cements. It works synergistically with Portland cement to expand strengths, shrink permeability, progress resist to organic chemistry attack and inhibits rebar corrosions. cement is employed, in exactly close to all concrete applications i.e. Concrete pavement structure, and foundation, wt. concrete applications, hold dear dams or holding walls, shaped and prestressed concrete, Piping and Blocking and Concrete exposed to severe environments, hold dear waste treatment and marine applications superior, high-strength concrete, hold dear highly-rises building structures or 100-year service life of the structure .cement is in addition uses in non-concrete applications hold dear soil-cement and unsafe waste curing.

### D. Over burn brick

Over burn bricks just one variety of unused clay over burn bricks of 250x120x70 metric linear unit operating size ware utilized in the investigation done before the over burn bricks were pulverized into a coarse aggregate their uniaxial compressive strength was recorded for examination with the combination created by crushing them all the way down to CA. The compressive strength of the complete over burn brick total strength found 14.5 Mpa.

### E. Over burn brick aggregate

Full over burn bricks were crushed to twenty metric linear unit the nominal size of aggregate according to Indian IS code 383-1970. Over burn bricks area unit crushed of automatically with jaw device manufacture flaky and elongated aggregate. the test of perform on the aggregate and check mechanical and physical property of the aggregate according to Indian IS code 2386-1963, it had been found that crushing price of the aggregate thirty second and the water absorption ten.413%, The fineness modulus of the over burn brick aggregate find to be seven.47, and relative density of coarse aggregate was a pair of 16. Figure showing aggregate used.



Fig. 2 Over burn brick aggregate used

### F. Admixture

A super plasticizer admixture according to IS:9103-1999 was added to the mixing of the water used in the admixture is clean and get better workability and other result in this dissertation, of effect of admixtures on the property of fresh and hard concrete. The specific gravity of admixture found to be 1.2.

### G. Water

Water is available in the college campus (ITM College Lucknow)

## III. PROCEDURE

### A. Water absorption test

Water absorption value of over burn bricks mostly influences the bond between over burn bricks. If water absorption in OBB is more and over burn bricks are not soaked before the masonry works, the water from freshly arranged mortar is possible to be absorbed by over burn bricks. This outcomes into reduced mortar strengthen as the necessary quantity of water will not be available for hydration procedure. This object designates the details procedures for water absorption tests for OBB as per IS 3495 – Part 2. In this we also used sensitives weigh balances and oven machine. The brick is dried in a ventilated broiler at a temperature of 105 degree Celsius to 115 degree celsius till it accomplishes fundamentally consistent mass. The samples is open the atmosphere in cooled at the temperature of 25 degree Celsius. Dry samples weight w1

- 1) The dry test samples is submerge totally in humidity,  $\{27\pm 2\}$  degree Celsius.
- 2) The samples is then evacuated and any hints of water are wiped out with a sodden fabric and the samples is weighed. The weighing is finished 3min after the samples has expelled from water. Record the weight as  $w_2$ . Water retention, percent by mass of 24- hour submersion in normal water is given by the formula of:  
 $\% \text{ of water absorption} = [(w_2 - w_1) / w_1] \times 100$
- 3) Unscrew 3. Unscrew the highest and place around 200g of broiler dried soil within the Pycnometer. Screw the highest. Decide the mass ( $M_2$ ).
- 4) Unscrew the highest and embody adequate measure of de-broadcast water to the Pycnometer so as to hide the dirt. Screw on the highest.
- 5) Shake well the substance. Interface the Pycnometer to a air pump to expel the entangled air, for around twenty minutes for fine-grained soils and around ten minutes for coarse-grained soils.
- 6) Bind the air pump Fill the by the water with Pycnometer, three-fourth full. Reapply the vacuum for around 5min until air rises quit revelation on the surface of the water.
- 7) Fill the Pycnometer with water completely up to the stamp. Dry it from outside to require its mass ( $M_3$ ).
- 8) Write the temperature of substance.
- 9) Unleash the Pycnometer Clean and wipe to dry it.
- 10) Fill the Pycnometer with water figuratively speaking. Wreck on the most effective to the check. Wipe it dry. Take its mass ( $M_4$ ).

#### B. Compressive Strength Of Over Burn Brick

For determination of compressive strength of over burn bricks, as per IS: 3495 – P (1)- 1992, we used the following procedure. In this we tested three numbers of over burn brick and the average value is reported. Compression Testing Machine (UTM), Scale for measuring dimension of over burn brick was required for this test. Before testing, UTM machine was properly checked. After that the load is applied in the following way:

- 1) Unevenness decided inside the bed countenances of over burn bricks is expelled to supply 2 plane and parallel, outside by hammering. It's humidity at room temperature for twenty-four hours.
- 2) The examples is then expelled and extra wet is wests out of room temp. The frog is top side of bricks and each one voids outside, the bed confront is load concretes, mortar, (1 bond: a couple of clean sand of review three millimeter and down). It's keep underneath the soddenly jutes, packs for twenty-four hours took after, by inundation in cleans waters for three day.
- 3) The examples is set equal faces even, and mortar complete face antagonizing in the air between 2 three employ ply board sheets everything about millimeter breadth and meticulously absorbed b\w plates of testing machines.
- 4) Loads is connected proximally at a uniform rate of ten Mpa all moment until the point that disappointments happen; the most load at disappointments; is note downs. The pile at disappointments; is view as the most extreme load at that the example ignore to create any more drawn out increment inside the temping rod to perusing on the testing machine.

#### C. Specific gravity test

The Pycnometer strategy can be utilized for assurance of the particular gravity of strong particles of both fine grained and coarse grained soils. The particular gravity of solids is resolved utilizing the accompanying strides to discover same.

- 1) Perfect and dry the Pycnometer; firmly screw its top. Take its mass ( $w_1$ ) to the closest of 00.100g.
- 2) Checked the top and Pycnometer; with a vertical line parallel to center of the Pycnometer to guarantee that the top is screwed to a parallel stamp each times.

Where,  $M_1$ =mass of empty Pycnometer,  
 $M_2$ = mass of the Pycnometer with dry soil  
 $M_3$ = mass of the Pycnometer and soil and water,  
 $M_4$  = mass of Pycnometer filled with water only.  $G$ =  
Specific gravity of solids.  
 $G = M_2 - M_1 (M_2 - M_1) - (M_3 - M_4)$

#### D. Slump test

Slump is an estimation of solids functionality, or smoothness. It's a roundabout estimation of solids constancy or solidness. A droop tests is a technique used to decide the constancy of cements. The consistency, or solidness, show how much water has been used as a part of the blend. The solidness of the solids blends ought's to be coordinating to the necessities for the complete item quality.

#### E. Mix design

The essential rule for blend plan of concrete according to the Indian code seems to be: 10262-2009 was taken after. As per the coal rule soaked and surface dry totals are utilized and if there should be an occurrence of total either soggy or dried modification is done as needs be. The vast majority of the past scientists who took the necessary steps on finished consume block total utilized immersed surface dry total, yet in genuine undertaking work it will be alongside difficult to get ready SSD total. In the event that the change is improved the situation extremely dry total including additional water for retention at that case add up to amount of water in the blend will be higher than the computed sum in light of the fact that amid the way toward setting just 75 to 85% water will be consumed by the total and remaining water in the blend will come about increment of w/c proportion on the grounds that in this way a large portion of the pores will be fixed by the lattice and the water will stay inside the concrete grains. In outcome of this there will be loss of quality. Then again if the water is blended

for assimilation just for the setting time frame it will deliver a solid of wanted functionality in the new state and now and again abatement of w/c proportion prompting expanded quality. Coarse total and fine total utilized as a part of the blend was halfway dried and along these lines in the estimation of blend plan essential modification was made for fine total. We used the following procedure from the Indian code IS: 10262-2009 to find the proportion of the ingredients used in the concrete. We used the following way to design the beams and cubes. We design this concrete for the M35 by using OPC 43 Grade of the cement and the maximum size of the over burn brick coarse aggregate is 20mm, initially we took 0.4 water cement ratio, through this we got the workability 90mm for this concrete. Because of designing this for very severe exposure condition, we handle this by hands. Unit weight of this concrete was about to 2186kg/m<sup>3</sup>, even the minimum cement content was 340kg/m<sup>3</sup> for this condition By using Water cement ratio (W/C) as 0.4, we got Cement content, 441.7kg/m<sup>3</sup>.but for this we found some ratios as follow.

Volume of coarse aggregate (CA) corresponding to 20mm size of aggregate and fine aggregate (zone 4th) & water cement ratio (W/C) is found = 0.66

Volume of coarse aggregate for water cement ratio of 0.4 = 0.66+0.22=0.68 Volume of fine aggregate = 1-0.68 = 0.32

#### IV. LITERATURE REVIEW

**Bazaz, (2006)**, Essential test outcomes show that the nature of such finished burn brick is low in correlation with normal rocks. This is because of generation procedure of such finished burn brick in Iran, which is mostly not the same as European nations. The compressive quality of cement made with smashed over burn brick is moderately low in correlation with common cement. Be that as it may, concrete over burn brick delivered with pulverized over burn brick appreciate a level of quality higher than conventional over burn brick; they could be utilized as finished burn brick in new structures.

**Mohammed (2004)**, The stay away from early weakening of solid structures, the sturdiness plan of the structures must be considered. More research on the strength of solid structures in Lucknow should be completed to comprehend decay forms in our hot and sticky nation. The nature of bond brands must be controlled for the supportable improvement of solid innovation. When they have comparative scraped area esteems, over consume block total solid gives higher qualities when contrasted with stone total cement. Reusing of wrecked cement is feasible for concrete in the quality range 20– 28Mpa. More courses are to be consolidated in the undergrad program on solid innovation.

#### V. OBJECTIVE OF WORK

As from the scope our aim is to make the over burn brick aggregate more and more capable to give compressive strength then people need not to use this stone aggregate because of scarce and there will be other option to use over burn brick aggregate, having low price, easily available, manufacture and also transferable. Over burn bricks are common place in

modern buildings construction. Recent building codes need to be anchored to a structural, backing in order to transfer out-of-planes loads. Conversely, for in-plane loads structural code assign over burn bricks as nonparticipating elements. This study exploit an experimental method to study the more strength provided by the cements using over burn brick aggregate.

#### VI. METHODOLOGY AND EXPERIMENTAL WORK

##### A. EXPERIMENTAL WORK

###### 1) Preparation of Sample

Crude materials that are utilized as a part of this investigation were ordinary Portland concrete, rock as coarse total, squander over consume block and fine blend. Diverse fundamental materials were natural frothing operator and appropriate water content. Amid this investigation, an entire of fifty solid blocks with measurement 150 mm x 150 mm x 150mm are made. All examples were made exploitation standard steel forms and were perfect to maintain a strategic distance from any pollutions snared to solid blends. One arrangement of solid examples were moreover been made as controls. After conventional commixture of between stone, squander over consume block, bond, sand and water, frothed were infused into the concrete blender all through commixture technique. The volumes of frothed required amid this investigation made up our psyches based generally from focused thickness at day 28. Foams zone unit made of a mix of water and characteristic natural substance compound. Elements of those air pockets region unit to help ensnared air into the blend and culminated the region. The examples are tried for 7, 14 and 28 days severally. The decrease in compressive quality was watched all the more essentially in reused concrete make with 50 percent Over Burn Bricks replace. The author decided that compressive strength and tensile strength were significantly affected when the replace levels of Over Burns Brick was varying b/w zero to 50 percent and no main change was observed in.



Fig. 3 Sample preparation of over burn brick aggregate

###### 2) Water Absorption Test Of Over Burn Bricks

Just a single sort of unused mud over burn brick of 90mm x 90mm x 190 mm working sizes was utilized as a part of the examination before the over torch blocks were pummeled into a coarse aggregate, their uniaxial compressive quality was recorded for relationship with the aggregate made by

squashing them down to coarse aggregate. The compressive nature of the entire over consume block is observed to be 14.5MPa. The water absorption take a look at was administrated for each OVB and GA in accordance to Indian standard codal IS 2386 (Part3) – 1963. the water absorption test is decided by measurement the increase in mass of AN oven-dried machine in put under in temperature range of 105 to 115 degree calicos in twenty-four hr. than immersed in water for twenty-four hours. The brick mass increases to the mass of the dry sample, expressed as a picee, is termed as absorption7. The water absorption outcomes as shown in Table 1. The water absorption in OVB was gated to be 5.25 percent. This worth was abundant beyond that GA, of that absorption was solely zero.25 percent. the upper water absorption was owing to the presence of a lot of pores in OVB Water absorption , % by mass, after 24 hours interest in normal water in given by the formula,

$$W = \{(M \times m) / m\} \times 100$$



Fig. 4- To find water absorption of brick

Table 1 Water absorption test of first class over burn brick

Mass of over burn brick before pour in water (kg)	Mass of over burn brick after poured in water (kg)	Water absorption (%)
m1=2.740	M1=2.920	6.569
m2=2.560	M2=2.680	4.687
m3=2.652	M3=2.772	4.52

Water absorption of over burn brick used =5.25%

### 3) Compressive Strength Test Of Over Burn Brick

For determining the compressive strength of over burn bricks by Compression test machines, the pressure plate directly throw the load on the cube of which should have ball, seating as segment of a circle focal point of which matches with the central point of the plate. Three numbers of whole over burn bricks from sample collected should be taken. Measurements estimated to the closest 1mm.Remove unevenness watched the bed, countenances to give two smooth parallel faces by pounding .Immerse in water at room temperature (relative humidity 60%) for 24 hours .Remove the example and deplete out any surplus dampness at room

temperature. Fill the frog (depth of rang 10- 20mm) it will be top of the brick and all voids in the bed faces flush with concrete mortar (1 bond: 2 sand). Store it under the moist jute packs for 24 hours filled by drenching in clean water for 3 days .Remove and wipe out any hints of dampness. Contact zone =250x120mm<sup>2</sup>. Table 2 show the compressive test result underneath.

Table 2 Compressive strength of over burn brick:-

S.No	Load (N)	Contact Area (mm <sup>2</sup> )	Compressive Strength (N/mm <sup>2</sup> )	Avg. compressive Strength (N/ mm <sup>2</sup> )
1	350000	190x90	20.467	23.197
2	400000	190x90	23.392	
3	440000	190x90	25.730	

Average compressive strength of over burn brick used =23.197 N/mm<sup>2</sup>



Fig. 5 Compressive strength test of over burn brick

### 4) Fine Aggregate

One type of fine total was utilized all through the trial work in order to keep the fine total variable steady. The sand was gathered from a neighborhood little stream from the streaming water which is by and large utilized as a part of the majority of developments in close region of this stream. The grain size of sand from every one of the sources in Lucknow is pretty much comparable. The strainer examination was done according to IS Code: 383-1970 for the fine total. The consequences of the evaluating fits inside the breaking points set out in IS: 383-1970 for reviewing zone – IV, which is the finest among all the reviewing zones according to Indian standard. The fineness modulus of the sand observed to be 1.97 and particular gravity 2.67. The sediment and mud substance of the fine total is 2%.

### 5) Over Burn Brick Aggregate

Full finished burn brick were pulverized to 20 mm ostensible size total according to Indian code seems to be: 383-1970. Over burn bricks squashed mechanically with jaw crusher create flaky and stretched total. Preliminary of mechanical and physical properties were done on the sums as indicated by IS: 2386-1963, it was found that overwhelming estimation of the aggregate 32% and water maintenance 5.25%, the fineness modulus of the over consume block total

observed to be 7.47 arranged for flexure test. Every one of the examples were kept in the molds for 24 hours and from that point those examples were demolded and put in the curing tank for 28 days in encompassing temperature. Every one of the examples were removed from the curing tank before testing and wiping the surface important test for uniaxial compressive quality was done in a pressure testing machine of 2000 kN limit. The flexural tests by two focuses stacking were done in a flexural testing machine of 100 KN limit.

6) *Specific Gravity Test*

The Pycnometer strategy can be used for assurance of the particular gravity of strong particles of equally fines grained and coarse grained soil. The particular gravity, of solids is resolved using the connection:



Fig. 6 Specific gravity test of over burn brick aggregate

Table 3 Specific gravity of over burn brick aggregate

Sl. No.	Observations and Calculations	Determination No.		
		1	2	3
Observation				
1	Pycnometer No.			
2	Room Temperature(degree Celsius)	25	25	25
3	Mass of empty Pycnometer (w1)	625	650	672
4	Mass of Pycnometer and dry agg (w2)	815	840	862
5	Mass of Pycnometer, agg and water (w3)	1628	1594	1655
6	Mass of Pycnometer and water (w4)	1528	1488	1555
Calculations				
7	M2 – M1	190	190	190
8	M3 – M4	100	106	100
9	Calculate G using formula	2.120	2.270	2.120

From the above table we obtained the specific gravity of over burn brick aggregate i.e. 2.17.

7) *Slump Test*

The slump testing result is a measure usefulness of cement and furthermore the conduct of a compacted improved cone of cement under, the activity of gravity. It quantifies the consistency or the wetness of cement. The solid slump test is utilized for the estimation of a property of new concrete. The test is an experimentally testing that measuring the usefulness of crisp cement. All the more particularly, it gauges consistency between clusters. The test is popular due to the simplicity of apparatus using, and simple procedure. Slump value was measured 90mm.



Fig. 7 Slump test

8) *Hardness Test of concrete*

Cube and beam specimens of size 150mm×150mm×150mm mm and of size 500mm×100mm×100mm, were used to determine the compressive and flexural strength at the end of 28 days. This test was conduct in the laboratory, as per IS 516-1969 on a compression testing machine of 2000 KN capacity and the load at the time of failure of specimen was recorded. We create the concrete for M25, M30 and M35 by using three type of cement like OPC PPC and PSG.

### B. CASTING OF BEAMS AND CUBES

The execution of cement is fractional by blending and an appropriate and great routine with regards to blending can prompt predominant execution and brilliance of the solid. In the present examination, M40 review standard solid shapes of size 150mm x 150mm x 150mm were thrown for deciding the compressive quality. The cast examples were demolded toward the finish of 24 hours and cured for the required 28 days curing. After the example has been remixing instantly plug the cube shape and minimal the concrete either mix by self-hand or by vibrating machines. Any air fixed in the solid will lessen the quality of the cubes. Consequently, the cube must be completely compacted. Nonetheless, mind should likewise be taken not to over smaller the solid as this may cause separation of the total and concretes glue in the blend. This may similarly diminish the last compressive quality.



Fig. 8 Casting of Cubes

### C. CURING OF SPECIMEN

Curing is the procedure in which the solid is shielded from loss of dampness and kept inside a sensible temp, run. The consequence of this procedure is expanded quality and diminished penetrability. Curing is additionally a key players, in alleviating splits in the solid, which seriously impacts toughness. Airs out enable access for destructive materials to sidestep the low penetrability concrete close to the surface. Great curing can help moderate the presence of spontaneous breaking. Whenever brilliant, appropriate, and reasonable curing is utilized, the measure of bond required to accomplish a given quality and solidness can be lessened by either exclusion or supplanting with supplementary cementitious materials. Since the bond is the most costly and vitality serious part of a solid blend, this prompts a decrease in the cost and the outright carbon impression of the solid blend. Furthermore, pragmatic curing techniques can upgrade supportability by decreasing the requirement for asset serious molding medicines, should the curing strategy be incongruent with the proposed benefit condition.



Fig. 9 curing of beams and cubes

## VII. RESULT AND DISCUSSION

Broad utilization of over burn brick total cement in this locales and the evident palatable execution of the current structure developed with over burn brick total cement, no efficient examination was led and appropriately archived for the over burn brick total found in this area. In a large portion of the development upto a decade ago for the most part ostensible blend concrete were utilized in light of discernment and collection of experience. With the headway of the solid innovation and to satisfy the sturdiness prerequisite M25 (28 days trademark compressive quality 25 Mpa when tried on 150 mm block) and higher level of cement is by and large utilized as a part of the greater part of the development now a days, in this way there is a total move of pattern to the utilization of stone total. In the wake of throwing the pillars and 3D squares we will play out the compressive and flexural quality test and every single other test. From the above investigation we can presume that this over burn brick total may give M25 and M30 compressive quality. We will likewise utilized two sort of different bonds as Portland pozzolana cement and Portland slag cement. This over burn brick aggregate having more permeability.

**Mix proportion:** With the help of above procedure we found the following quantity of the below constituents for the 1m<sup>3</sup> volume.

Cement=441.75kg Water=176.7kg

Coarse aggregate=998.226kg Fine aggregate=580.67kg Super plasticizer=4.418kg

But the volume of three beams and three cubes, which we want to cast

$$=3[500\text{mm}\times 100\text{mm}\times 100\text{mm}+150\text{mm}\times 150\text{mm}\times 150\text{mm}]$$

$$\text{Total volume}=0.02513\text{m}^3$$

### MIX PROPORTION FOR M30 (OPC43)

In this proportion we used OPC43 grade of cement and design it for M30 table 4.1 showing the compressive and flexural strength of the design. Graph 4.1 also showing more the variation of the compressive strength for the same.

$$\text{Target strength}=30+1.65\times 5=38.25\text{Mpa}$$

$$\text{Water cement ratio}=0.45$$

$$\text{Water}=5.44\text{litres}$$

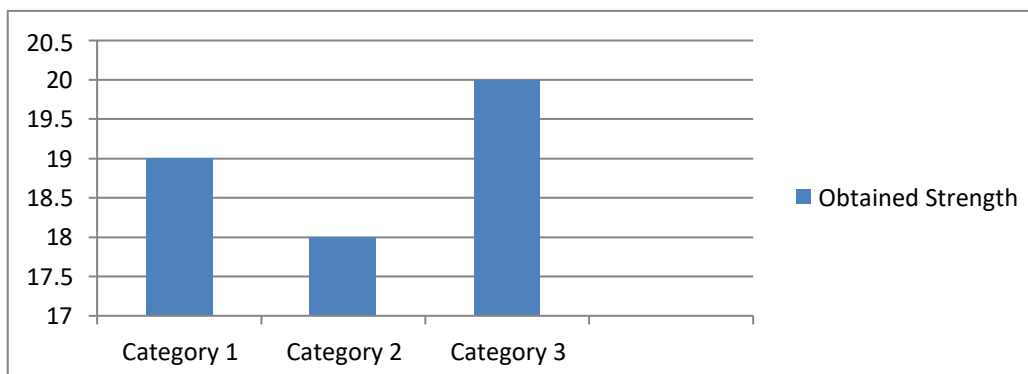
$$\text{Super plasticizer}=100\text{ml}$$

$$\text{Cement}=12.09\text{kg}$$

Table 4 Result of M30 using OPC43

S.No.	Compressive Strength (Mpa)		
1	19	18	20

Average Compressive strength = 19.00Mpa



Graph 4.1 Compressive strength of M30

### VIII. CONCLUSION

Crushed over burn blocks can be utilized attractively to deliver M25 and M30 solid keeping water concrete proportion in the scope of 0.4 to 0.45. Adequate functionality upto the level of pumpable cement can similarly be accomplished by appropriately using the super plasticizer inside a scope of 0.8% to 1% by weight of bond. Flexural superiority similarly can be acquired according to the codal condition and much more. For blend plan it isn't required to make the total SSD either by presoaking or giving extra water to add up to water retention, rather water assimilation for 3 minutes might be alluded as the ingestion for dry total. Fine total having low fineness modulus is equally fit for delivering standard cement. Strength part of cement made of over consume block total may additionally be examined for porousness and stop and defrost impact. Additionally think about is required for over consume block total produced using guardian over consume block of various quality. Over burn brick aggregate can be effectively used as a coarse aggregate but strength of this aggregate is less than that of stone aggregate for same size of the aggregate. Over burn brick aggregate have more permeability than natural aggregate and it is the important characteristic of this aggregate and perform better in this regard so over burn brick aggregate can be used where load is comparatively less and required more permeability. The mixture of different size is also increase the strength and will increase its suitability and scope of application. Deformation is large in the over burn brick aggregate than the natural aggregates. Recycled fine aggregates produced from demolition waste can be utilized in over burn brick mixtures as a good substitute for natural sand. Over burn brick concrete weight is less than natural aggregate about 18.33% and rate of decrease unit weight of mixed aggregate but void ratio increase. About 13-21% reduction in compressive strength of concrete is found. This study has

found that crushed bricks will be used satisfactory as coarse combination for creating concrete of acceptable strength characteristics. The similar mixing of GA concrete will be adoptive for the assembly of OBBAC. however ever the OBBA are layer with cement suspension before the used in concrete. each the aggregate will be used in the SSD condition. the use of broken bricks as coarse combination decreases the compressive strength of concrete regarding (11-87) percent at age of twenty eight days per the quantitative relation of broken bricks are used. The impact and crushing values of OBBA square measure above the GA however at intervals the appropriate limits as per suggested by IS code. The density of OBBA is a small amount than the GA and he will be categorized as light-weight combination. The reprocessed brick combination concrete created with this OBBA will be used wherever aggregate of 20mm is needed. The workability of the broken over burn bricks concrete is less than that of traditional concrete.

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